Hearing Aid Compatibility (HAC)
T-Coil Test Report

for

Symbol Technologies, Inc., A Motorola Company

on the

Mobile Computer

Report Number	:	**HA8O3027-01B**
Trade Name	:	**Symbol**
Model Name	:	**FR6074**
FCC ID	:	**H9PFR6074**
Date of Testing	:	**Mar. 17, 2009**
Date of Report	:	**Mar. 17, 2009**

- **Results Summary : T Category = T3 (ANSI C63.19-2007)**
- The test results refer exclusively to the presented test model/sample only.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- Report Version: Rev.01

SPORTON International Inc.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Table of Contents

1. *Statement of Compliance*

The Hearing Aid Compliance (HAC) maximum results found during testing for the **Symbol Technologies, Inc., A Motorola Company Mobile Computer FR6074** are as follows (with expanded uncertainly ±8.1% for AMB1 and ±12.3% for AMB2):
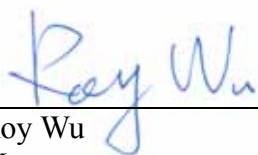
Reference (63.19)	Description	Verdict	Section
7.3.1.1	Axial Field Intensity	Pass	9.2.1
7.3.1.2	Radial Field Intensity	Pass	9.2.2
7.3.2	Frequency Response	Pass	9.2.3
7.3.3	Signal Quality	T3	9.2.4

Band	(S+N)/N in dB	T Rating
GSM850	28.10	T3
PCS1900	31.30	T4

They are in compliance with HAC limits specified in guidelines FCC 47CFR §20.19 and ANSI Standard ANSI C63.19 for HAC Rated category.

Results Summary : T Category = T3 (ANSI C63.19-2007)

Approved by

Roy Wu
Manager

2. *Administration Data*

2.1 *Testing Laboratory*

Company Name :   Sporton International Inc.
Address :   No. 52, Hwa-Ya 1st RD., Hwa Ya Technology Park, Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
Test Site :   SAR01-HY
Telephone Number : 886-3-327-3456
Fax Number :   886-3-328-4978

2.2 *Detail of Applicant*

Company Name :   Symbol Technologies, Inc., A Motorola Company
Address :   230 Victoria Street #12-06/10 Bugis Junction Office Tower Singapore 188024

2.3 *Detail of Manufacturer*

Company Name :   Inventec Appliances Corp.
Address: No. 37, Wugong 5th Road, Wugu Industrial Park, Taipei Country 248, Taiwan, R.O.C.

2.4 *Application Details*

Date of reception of application: Oct. 31, 2008
Start of test :   Jan. 12, 2009
End of test :   Jan. 12, 2009

3.   *General Information*

3.1   *Description of Device Under Test (DUT)*

Product Feature & Specification	
DUT Type :	Mobile Computer
Trade Name :	Symbol
Model Name :	FR6074
FCC ID :	H9PFR6074
Tx Frequency :	GSM850 : 824 MHz ~ 849 MHz PCS1900 : 1850 MHz ~1910 MHz
Rx Frequency :	GSM850 : 869 MHz ~ 894 MHz PCS1900 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna :	GSM850 : 32.19 dBm PCS1900 : 29.37 dBm
Antenna Type :	Fixed Internal
HW Version :	DVT
SW Version :	Modem: 0024-010709-M OS: Handy-DVT1-0.31.0057-020209-WWE-H
Type of Modulation :	GMSK
DUT Stage :	Identical Prototype

3.2   Basic Description of Accessories

Cradle	**Brand Name**	Symbol
	Model Name	CRD7X00-1
	Power Rating	12Vdc, 3.33A
Cradle Adapter	**Brand Name**	HIPRO
	Model Name	HP-O2040D43
	Power Rating	I/P: 100-240Vac, 50-60Hz, 1.5A; O/P: 12V, 3.33A
	Power Cord Type	1.8 meter shielded cable with ferrite core
Product Charging Adapter	**Brand Name**	MOTOROLA
	Model Name	EADP-16BB A
	Power Rating	I/P: 100-240Vac, 50-60Hz, 0.4A; O/P: 5.4V, 3A
	Power Cord Type	1.83 meter shielded cable without ferrite core
Product Charging Cable 1	**Brand Name**	MOTOROLA
	Part Number	25-102775-01R
	Power Rating	I/P: 5.4V, 3A
	Power Cord Type	1.35 meter non-shielded cable with ferrite core
Product Charging Cable 2	**Brand Name**	MOTOROLA
	Part Number	25-118708-01R
	Power Rating	I/P: 5.4V, 3A
	Power Cord Type	1.35 meter non-shielded cable with ferrite core
Battery	**Brand Name**	MOTOROLA
	Part Number	82-71364-05
	Power Rating	3.7Vdc, 3600mAh, 13.3Wh
	Type	Li-ion
Earphone	**Brand Name**	Symbol
	Part Number	90-17C28-001R
	Signal Line Type	1.24 meter non-shielded cable without ferrite core
USB Cable	**Brand Name**	MOTOROLA
	Part Number	25-68596-01R
	Type	1.58 meter shielded cable without ferrite core

Remark:

1. The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

2. Product Charging Cable 1 (P/N: 25-102775-01R) and Product Charging Cable 2 (P/N: 25-118708-01R) are exactly the same which was declared by the manufacturer, and only Product Charging Cable 1 (P/N: 25-102775-01R) was performed on all the tests.

3.3 *Applied Standards*

The Standard ANSI C63.19:2007 represents performance requirements for acceptable interoperability of hearing aids with wireless communications devices. When these parameters are met, a hearing aid operates acceptably in close proximity to a wireless communications device.

3.4 *Test Conditions*

3.4.1 Ambient Condition

Ambient Temperature (°C)	20-24
Humidity (%)	<60
Acoustic Ambient Noise	>10dB below the measurement level

3.4.2 Test Configuration

The device was controlled by using a base station emulator R&S CMU200. Communication between the device and the emulator was established by coaxial connection.

The DUT was set from the emulator to radiate maximum output power during all testing.

4.   *Hearing Aid Compliance (HAC)*

4.1   *Introduction*

In September 2006, the T-Coil requirements of ANSI C63.19 Standard went into effect. The federal communication commission (FCC) adopted ANSI C63.19 as HAC test standard.

5.   *HAC T-Coil Measurement Setup*

5.1   *System Configuration*

Figure 5.1: T-Coil setup with HAC Test Arch and AMCC

The DASY4 system for performance compliance tests is illustrated above graphically. This system consists of the following items:

➢ A standard high precision 6-axis robot with controller, a teach pendant and software
➢ A data acquisition electronic (DAE) attached to the robot arm extension
➢ A dosimetric probe equipped with an optical surface detector system
➢ The electro-optical converter (EOC) performs the conversion between optical and electrical signals
➢ A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
➢ A probe alignment unit which improves the accuracy of the probe positioning
➢ A computer operating Windows XP
➢ DASY4 software
➢ Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
➢ The SAM twin phantom
➢ A device holder
➢ Dipole for evaluating the proper functioning of the system
➢ Arch Phantom

Some of the components are described in details in the following sub-sections.

5.2 *AM1D probe*

The AM1D probe is an active probe with a single sensor. It is fully RF-shielded and has a rounded tip 6mm in diameter incorporating a pickup coil with its center offset 3mm from the tip and the sides. The symmetric signal preamplifier in the probe is fed via the shielded symmetric output cable from the AMMI with a 48V "phantom" voltage supply. The 7-pin connector on the back in the axis of the probe does not carry any signals. It is mounted to the DAE for the correct orientation of the sensor. If the probe axis is tilted 54.7 degree from the vertical, the sensor is approximately vertical when the signal connector is at the underside of the probe (cable hanging downwards).

Specification:

Frequency range	0.1 ~ 20 kHz (RF sensitivity <-100dB, fully RF shielded)
Sensitivity	<-50dB A/m @ 1 kHz
Pre-amplifier	40 dB, symmetric
Dimensions	Tip diameter/ length: 6/ 290 mm, sensor according to ANSI-PC63.19

5.2.1 *Probe Calibration in AMCC*

The probe sensitivity at 1 kHz is 0.0625214V/(A/m) (-24.0dBV/(A/m)) was calibrated by AMCC coil for verification of setup performance. The evaluated probe sensitivity was able to be compared to the calibration of the AM1D probe. The frequency response and sensitivity was shown in Figure 5.2. The probe signal is represented after application of an ideal integrator. The green curve represents the current though the AMCC, the blue curve the integrated probe signal. The DIFFERENCE between the two curves is equivalent to the frequency response of the probe system and shows the characteristics. The probe/system complies with the frequency response and linearity requirements in C63.19 according to the Speag's calibrated report as shown in Annex B (AM1D probe: SPAM100AF) (1)The frequency response has been tested within +/- 0.5 dB of ideal differentiator from 100 Hz to 10 kHz. (2)The linearity has also been tested within 0.1dB from 5 dB below limitation to 16 dB above noise level. The AMCC coil is qualified according to certificate report, SDHACPO02A as shown in Annex B.
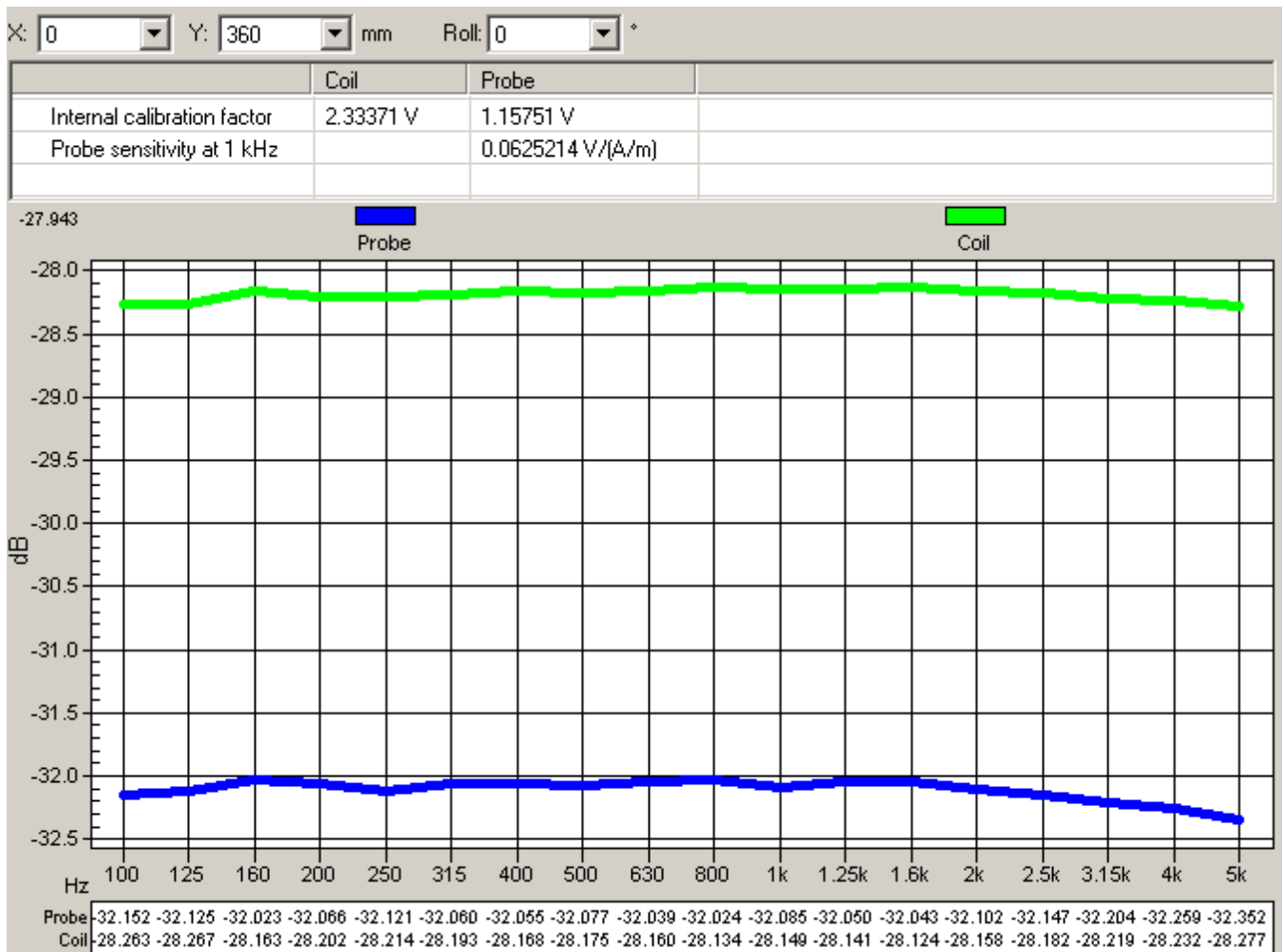

	Coil	Probe	
Internal calibration factor	2.33371 V	1.15751 V	
Probe sensitivity at 1 kHz		0.0625214 V/(A/m)	

Hz	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k
Probe	-32.152	-32.125	-32.023	-32.066	-32.121	-32.060	-32.055	-32.077	-32.039	-32.024	-32.085	-32.050	-32.043	-32.102	-32.147	-32.204	-32.259	-32.352
Coil	-28.263	-28.267	-28.163	-28.202	-28.214	-28.193	-28.168	-28.175	-28.160	-28.134	-28.149	-28.141	-28.124	-28.158	-28.182	-28.219	-28.232	-28.277

Figure 5.2: The frequency response and sensitivity of AM1D probe

5.3 *AMCC*

The Audio Magnetic Calibration coil is a Helmholtz Coil designed for calibration of the AM1D probe. The two horizontal coils generate a homogeneous magnetic field in the z direction. The DC input resistance is adjusted by a series resistor to approximately 50Ohm, and a shunt resistor of 10 Ohm permits monitoring the current with a scale of 1:10.

Port description:

Signal	Connector	Resistance
Coil In	BNC	typically 50 Ohm
Coil Monitor	BNO	10Ohm ±1%(100mV corresponding to 1 A/m)

Specification:

Dimensions	370 x 370 x 196 mm, according to ANSI C63.19

5.4 *AMMI*

Figure 5.3: AMMI front panel

The Audio Magnetic Measuring Instrument (AMMI) is a desktop 19-inch unit containing a sampling unit, a waveform generator for test and calibration signals, and a USB interface.
Specification:

Sampling rate	48 kHz/24 bit
Dynamic range	85 dB
Test signal generation	User selectable and predefined (vis PC)
Calibration	Auto-calibration/full system calibration using AMCC with monitor output
Dimensions	482 x 65 x 270 mm

5.5 DATA Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.

5.6 Robot

The DASY4 system uses the high precision robots RX90BL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY4 system, the CS7MB robot controller version from Stäubli is used. The RX robot series have many features that are important for our application:

➢ High precision (repeatability 0.02 mm)
➢ High reliability (industrial design)
➢ Jerk-free straight movements
➢ Low ELF interference (the closed metallic construction shields against motor control fields)
➢ 6-axis controller

5.7 Measurement Server

The DASY4 measurement server is based on a PC/104 CPU board with

166 MHz CPU
32 MB chipset and
64 MB RAM.

Communication with
the DAE electronic box
the 16-bit AD-converter system for optical detection and digital I/O interface.

The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

5.8 *Phone Positioner*

The phone positioner shown in Figure 5.4 is used to adjust DUT to the suitable position.

Figure 5.4: Phone Positioner

5.8.1   Test Arch Phantom

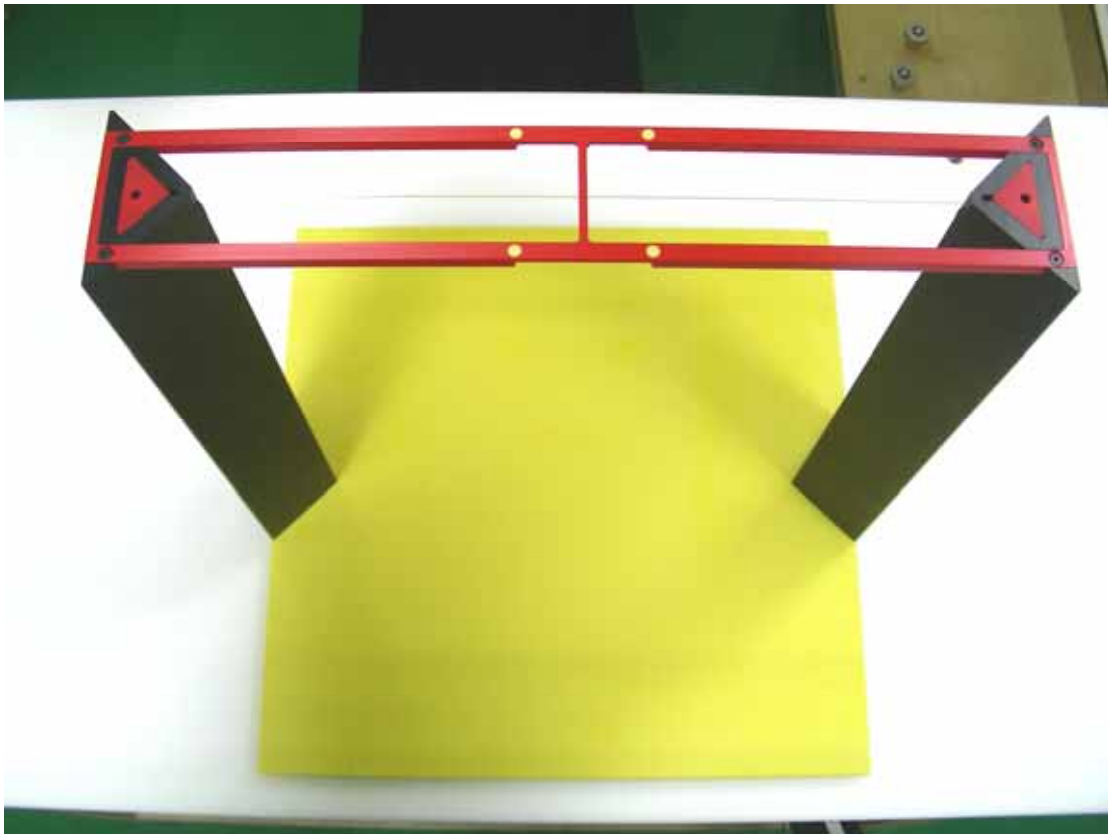|	
Construction	Enables easy and well defined positioning of the phone and validation dipoles as well as simple teaching of the robot.
Dimensions	370 x 370 x 370 mm

Figure 5.5: Test Arch Phantom

5.9 *Cabling of System*

The principal cabling of the T-Coil setup is shown in Figure 5.6. All cables provided with the basic setup have a length of approximately 5 m.
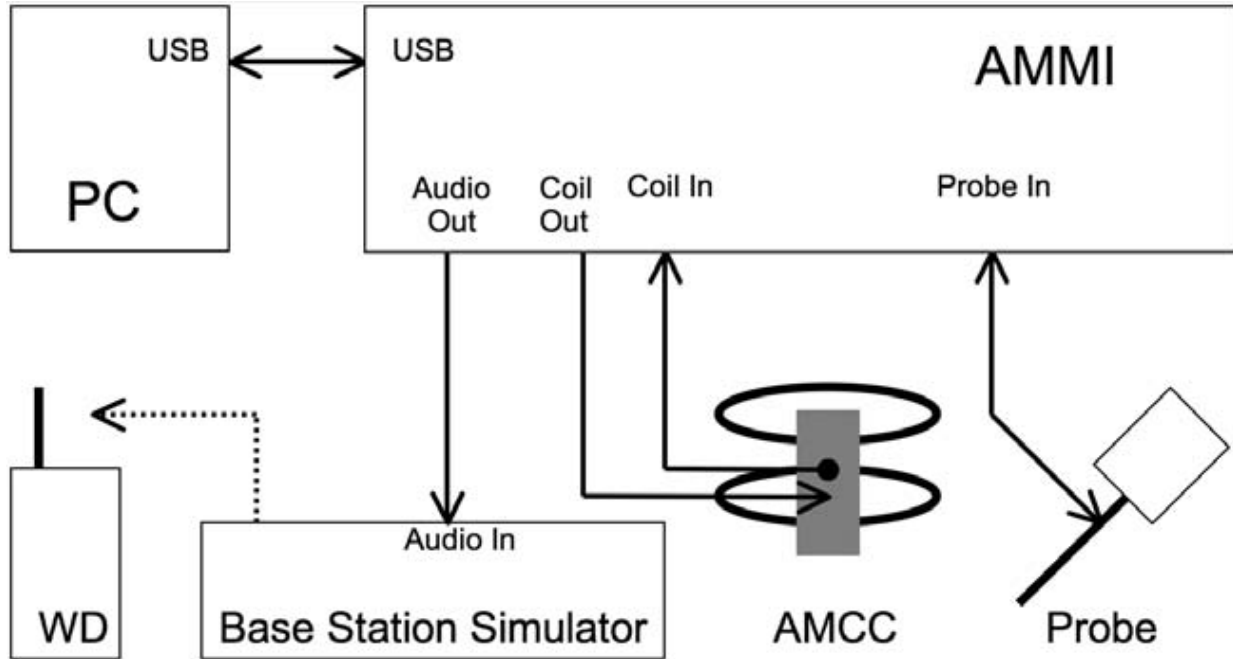

Figure 5.6: T-Coil setup cabling

5.10 HAC Extension Software for DASY4

Specification:

|	
Precise teaching	Easy teaching with adaptive distance verification
Measurement area	Flexible selection of measurement area, predefined according to ANSI C63.19
Evaluation	ABM: spectral processing, filtering, weighting and evaluation according to ANSI C63.19
Report	Documentation ready for compliance report

5.11 Test Equipment List

| Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Isotropic E-Filed Probe	ER3DV6	2358	Jan. 14, 2009	Jan. 13, 2010
SPEAG	Isotropic H-Filed Probe	H3DV6	6184	Jan. 19, 2009	Jan. 18, 2010
SPEAG	Audio Magnetic 1D Field Probe	AM1DV2	1030	Apr. 16, 2008	Apr. 15, 2009
SPEAG	Audio Magnetic Calibration Coil	AMCC	1049	NCR	NCR
SPEAG	Audio Measuring Instrument	AMMI	1041	NCR	NCR
SPEAG	835MHz Calibration Dipole	CD835V3	1045	Sep. 25, 2007	Sep. 24, 2009
SPEAG	1880MHz Calibration Dipole	CD1880V3	1038	Sep. 27, 2007	Sep. 26, 2009
SPEAG	2450MHz Calibration Dipole	CD2450V3	1039	Sep. 27, 2007	Sep. 26, 2009
SPEAG	Data Acquisition Electronics	DAE3	577	Nov. 12, 2008	Nov. 11, 2009
SPEAG	Data Acquisition Electronics	DAE4	778	Sep. 22, 2008	Sep. 21, 2009
SPEAG	Test Arch Phantom	N/A	N/A	NCR	NCR
SPEAG	Phone Positoiner	N/A	N/A	NCR	NCR
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Dec. 15, 2008	Dec. 14, 2009
R&S	Universal Radio Communication Tester	CMU200	105934	Nov. 11, 2008	Nov. 10, 2009
Agilent	Dual Directional Coupler	778D	50422	NCR	NCR
AR	Power Amplifier	5S1G4M2	0328767	NCR	NCR
R&S	Power Meter	NRVD	101394	Oct. 20, 2008	Oct. 19, 2009
R&S	Power Sensor	NRV-Z1	100130	Oct. 20, 2008	Oct. 19, 2009

Table 5.1 Test Equipment List

5.12 Reference Input of Audio Signal Spectrum

With the reference job "use as reference" in the beginning of a procedure, measure the spectrum of the current when applied to the AMCC, i.e. the input magnetic field spectrum, as shown below Fig. 5.7 and Fig. 5.8. For this, the delay of the window shall be set to a multiple of the signal period and at least 2s. From the measurement on the device, using the same signal, the postprocessor deducts the input spectrum, so the result represents the net DUT response.
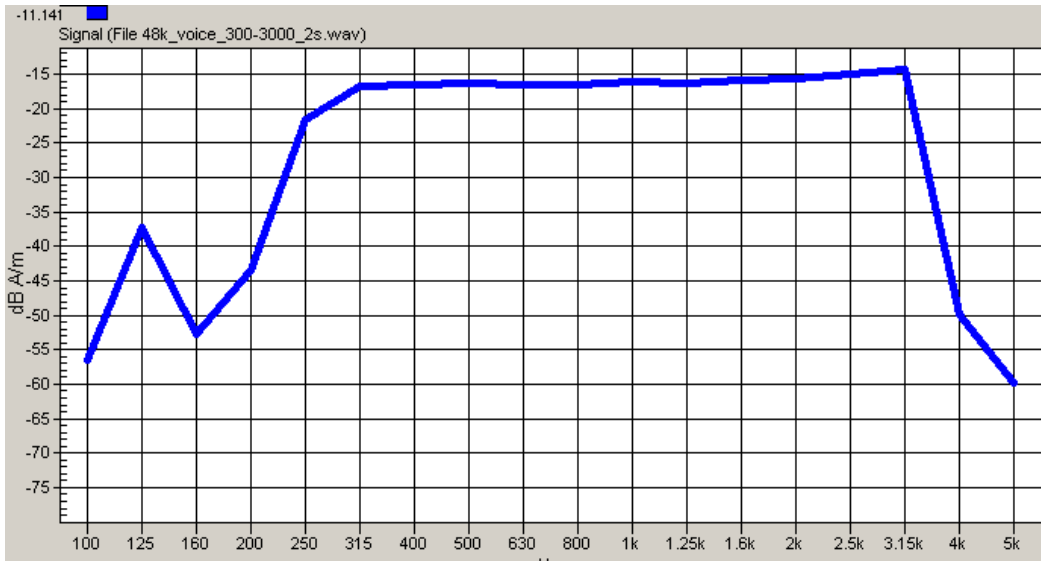
Figure 5.7: Audio signal spectrum of the broadband signal (48kHz_voice_300Hz~3 kHz)
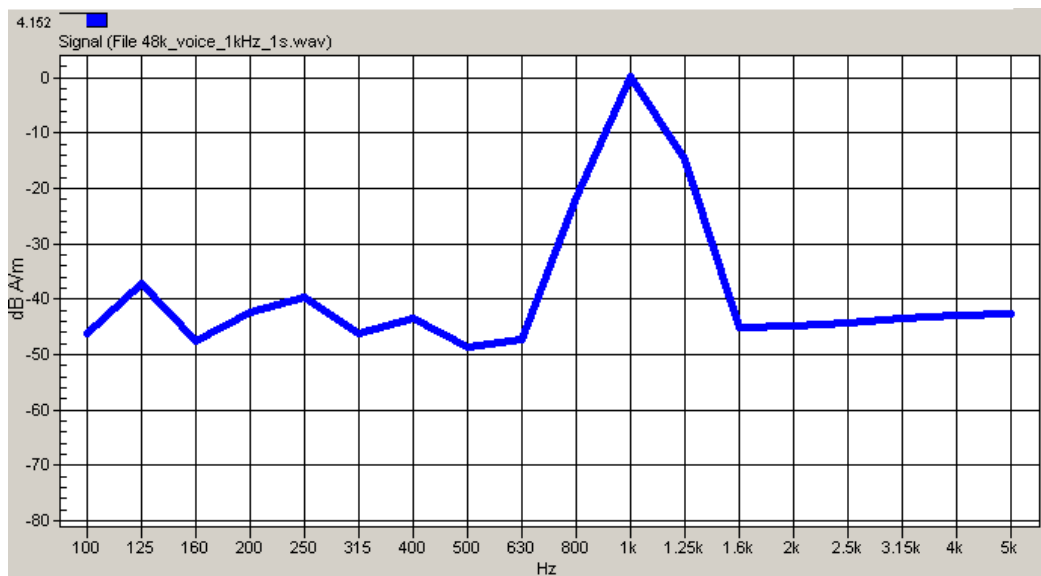
Figure 5.8: Audio signal spectrum of the narrowband signal (48kHz_voice_1kHz)

5.13 *Signal Verification*

According to ANSI C63.19:2007 section 6.3.2.1, the normal speech input level for HAC T-coil tests shall be set to -16 dBm0 for GSM and UMTS (WCDMA), and to -18 dBm0 for CDMA. This technical note shows a possibility to evaluate and set the correct level with the HAC T-Coil setup with a Rohde&Schwarz communication tester CMU200 with audio option B52 and B85.

Establish a call from the CMU200 to a wireless device. Select CMU200 Network Bitstream "Decoder Cal" to have a 1 kHz signal with a level of 3.14 dBm0 at the speech output. Run the measurement job and read the voltage level at the multi-meter display "Coil signal". Read the RMS voltage corresponding to 3.14 dBm0 and note it. Calculate the desired signal levels of -16 dBm0:

3.14 dBm0 = -2.28 dBV
-16 dBm0 = -21.42 dBV

Determine the 1 kHz input level to generate the desired signal level of -18 dBm0. Select CMU200 Network Bitstream "Codec Cal" to loop the input via the codec to the output. Run the measurement job (AMMI 1kHz signal with gain 10 inserted) and read the voltage level at the multimeter display "Coil signal". Calculate the required gain setting for the above levels:

Gain 10 = -20.09 dBV
Difference for -16 dBm0 = -21.42 - (-20.09) = -1.33 dB
Gain factor = 10 ^ ((-1.33) / 20) = 0.858
Resulting Gain = 10 x 0.858 = 8.58

The predefined signal types have the following differences / factors compared to the 1 kHz sine signal:

Signal Type	Duration (s)	Peak to RMS (dB)	RMS (dB)	Gain Factor	Gain Setting
1kHz	1	16.2	-12.7	4.33	37.161
300Hz ~ 3kHz	2	21.6	-18.6	8.48	72.777

6.   *Description for DUT Testing Position*

Figure 6.1 illustrate the references and reference plane that shall be used in a typical DUT emissions measurement. The principle of this section is applied to DUT with similar geometry.

● The area is 5 cm by 5 cm.
● The area is centered on the audio frequency output transducer of the DUT.
● The area is in a reference plane, which is defined as the planar area that contains the highest point in the area of the phone that normally rests against the user's ear. It is parallel to the centerline of the receiver area of the phone and is defined by the points of the receiver-end of the DUT handset, which, in normal handset use, rest against the ear.
● The measurement plane is parallel to, and 10 mm in front of, the reference plane.
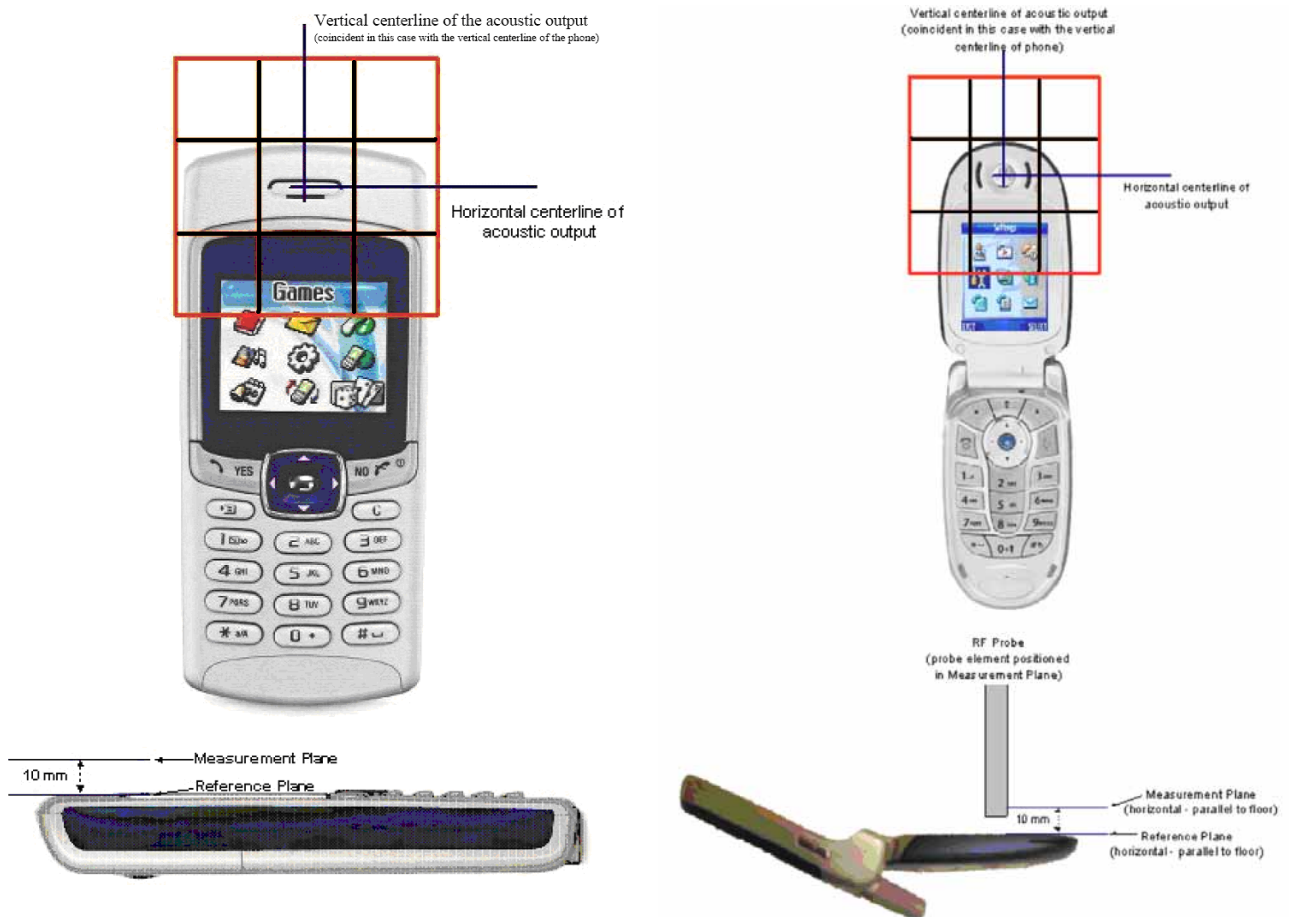
Figure 6.1: A typical DUT reference and plane for T-Coil measurements

7.   *T-Coil Test Procedure*

The following illustrate a typical test scan over a wireless communications device:

1.   Geometry and signal check: system probe alignment, proper operation of the field probe, probe measurement system, other instrumentation, and the positioning system was confirmed. A surface calibration was performed before each setup change to ensure repeatable spacing and proper maintenance of the measurement plane using the test Arch.

2.   Set the reference drive level of signal voice defined in C63.19 per 6.3.2.1, as shown in this report of section 5.12.

3.   The ambient and test system background noise (dB A/m) was measured as well as ABM2 over the full measurement. The maximum noise level must be at least 10dB below the limit of C63.19 per 7.3.2.

4.   The DUT was positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.

5.   The DUT operation for maximum rated RF output power was configured and connected by using of coaxial cable connection to the base station simulator at the test channel and other normal operating parameters as intended for the test. The battery was ensured to be fully charged before each test. The center sub-grid was centered over the center of the acoustic output (also audio band magnetic output, if applicable). The DUT audio output was positioned tangent (as physically possible) to the measurement plane.

6.   The DUT's RF emission field was eliminated from T-coil results by using a well RF-shielding of the probe, AM1D, and by using of coaxial cable connection to a Base Station Simulator. One test channel was pre-measurement to avoid this possibility.

7.   Determined the optimal measurement locations for the DUT by following the three steps, coarse resolution scan, fine resolution scans, and point measurement, as described in C63.19 per 6.3.4.4. At each measurement locations, samples in the measurement window duration were evaluated to get ABM1 and the signal spectrum. The noise measurement was performed after the scan with the signal, the same happened, just with the voice signal switched off. The ABM2 was calculated from this second scan.

(1) Coarse resolution scans (1 kHz signal at 50 x 50 mm grid area with 10 mm spacing). Only ABM1 was measured in order to find the location of T-Coil source.

(2)Fine resolution scans (1 kHz signal at 10 x 10 mm grid area with 2 mm spacing). The positioned appropriately based on optimal AMB1 of coarse resolution scan. Both ABM1 and ABM2 were measured in order to find the location of the SNR point.

(3) Point measurement (1 kHz signal) for ABM1 and ABM2 in axial, radial transverse and radial longitudinal. The positioned appropriately based on optimal SNR of fine resolution scan. The SNR was calculated for axial, radial transverse and radial longitudinal orientation.

(4) Point measurement (300Hz to 3 kHz signal) for frequency response in axial. The positioned appropriately based on optimal SNR of fine resolution axial scan.

8. All results resulting from a measurement point in a T-Coil job were calculated from the signal samples during this window interval. ABM values were averaged over the sequence of these samples.

9. At an optimal point measurement, the SNR (ABM1/ABM2) was calculated for axial, radial transverse and radial longitudinal orientation, and the frequency response was measured in axial axis.

10. Corrected for the frequency response after the DUT measurement since the DASY4 system had known the spectrum of the input signal by using a reference job, as shown in this report of section 5.12.

11. In SEMCAD post-processing, the spectral points are in addition scaled with the high-pass (half-band) and the A-weighting, bandwidth compensated factor (BWC) and those results are final as shown in this report.

12. Classified the signal quality based on the table 8.1: T-Coil Signal Quality Categories.

8. *T-Coil Signal Quality Categories*

This section provides the signal quality requirement for the intended T-Coil signal from a WD. Only the RF immunity of the hearing aid is measured in T-Coil mode. It is assumed that a hearing aid can have no immunity to an interference signal in the audio band, which is the intended reception band for this mode. A device is assessed beginning by determining the category of the RF environment in the area of the T-Coil source.

The RF measurements made for the T-Coil evaluation are used to assign the category T1 through T4. The limitation is given in Table 8.1. This establishes the RF environment presented by the WD to a hearing aid.

Category	Telephone parameters WD signal quality ((signal + noise) to noise ratio in dB)
Category T1	0 to 10 dB
Category T2	10 to 20 dB
Category T3	20 to 30 dB
Category T4	> 30 dB

Table 8.1: T-Coil signal quality categories

9.   *Summary of Measurement Result*

9.1   *Test Result*

9.1.1 Conducted Power

Band	GSM 850			GSM 1900		
Channel	128	189	251	512	661	810
GSM	32.19	31.96	31.66	29.15	29.29	29.37

Unit: dBm

9.1.2 Magnitude Result

The Table 9.1 shows testing result in position coordinates which are defined as deviation from earpiece center in millimeters. Axial measurement location was defined by the manufacture of the device. Signal strength measurement scans are presented in Annex A.

Probe Position	Band	Channel	Measurement Position (x mm, y mm)	Ambient Background Noise (dB A/m)	ABM2 (dB A/m)	ABM1 (dB A/m)	SNR (dB)
Radial 1 (Longitudinal)	GSM850	128	(-8, -18)	-46.65	-35.32	-3.070	28.40
		189	(-10, -16)	-47.65	-31.41	-3.340	28.10
		251	(-10, -18)	-47.48	-31.90	-3.300	28.60
	PCS1900	512	(-10, -18)	-47.40	-34.35	-3.100	31.30
		661	(-10, -18)	-47.44	-34.57	-3.210	31.40
		810	(-8, -18)	-47.24	-34.60	-3.270	31.30
Radial 2 (Transversal)	GSM850	128	(0, -26)	-40.00	-31.43	-3.440	31.90
		189	(0, -26)	-40.23	-34.52	-3.630	30.90
		251	(0, -26)	-40.14	-34.73	-3.660	31.10
	PCS1900	512	(0, -26)	-40.02	-35.86	-3.590	32.30
		661	(0, -26)	-40.18	-35.72	-3.530	32.20
		810	(0, -26)	-39.80	-35.90	-3.640	32.30
Axial	GSM850	128	(0, -16)	-51.14	-30.26	4.880	35.10
		189	(0, -16)	-51.01	-29.46	4.600	34.10
		251	(0, -16)	-51.00	-29.58	4.510	34.10
	PCS1900	512	(0, -18)	-51.17	-30.29	4.700	35.00
		661	(0, -16)	-51.13	-30.10	4.770	34.90
		810	(0, -18)	-50.28	-30.35	4.600	35.00

Table 9.1: Test Result for Various Positions

Remark:
1. There is no special HAC mode software on this DUT.
2. The LCD backlight, Bluetooth and WLAN functions are turn off and the volume is adjusted to maximum level during T-Coil testing.
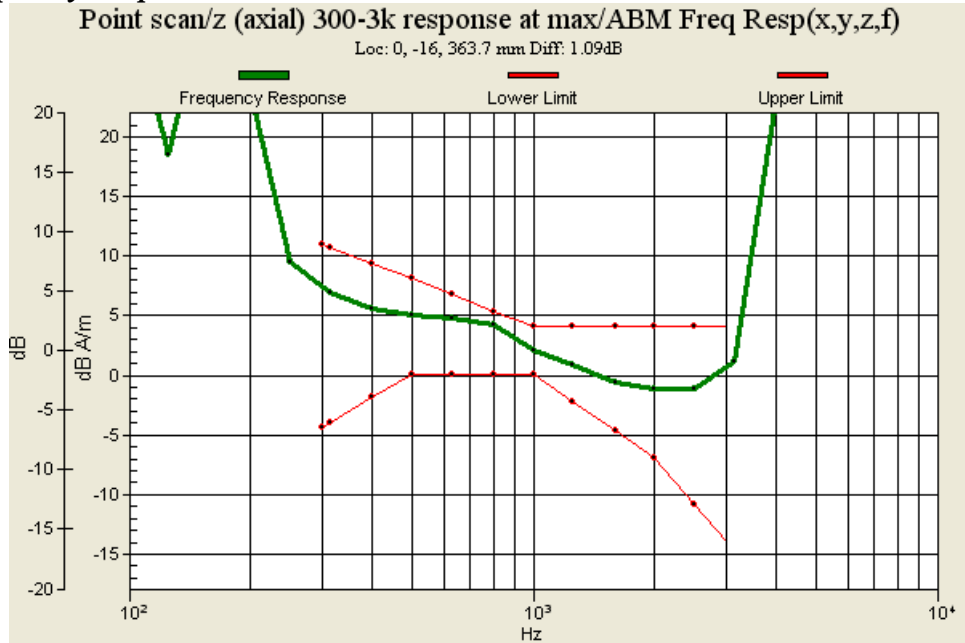3. Test Engineer   Robert Liu

9.1.2 Frequency Response
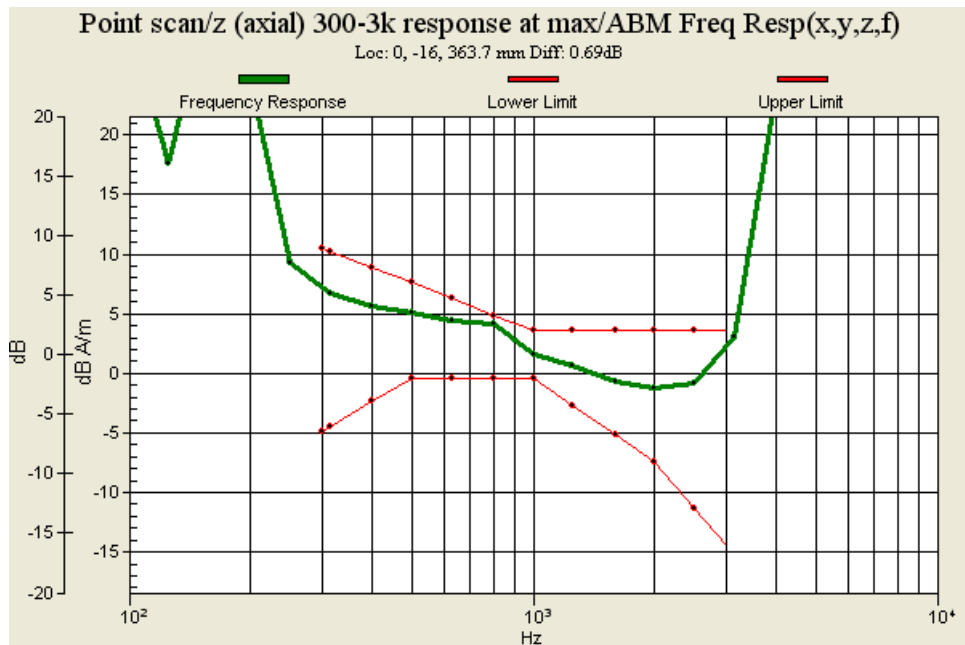

Figure 9.1: Frequency Response of GSM850 for Ch128

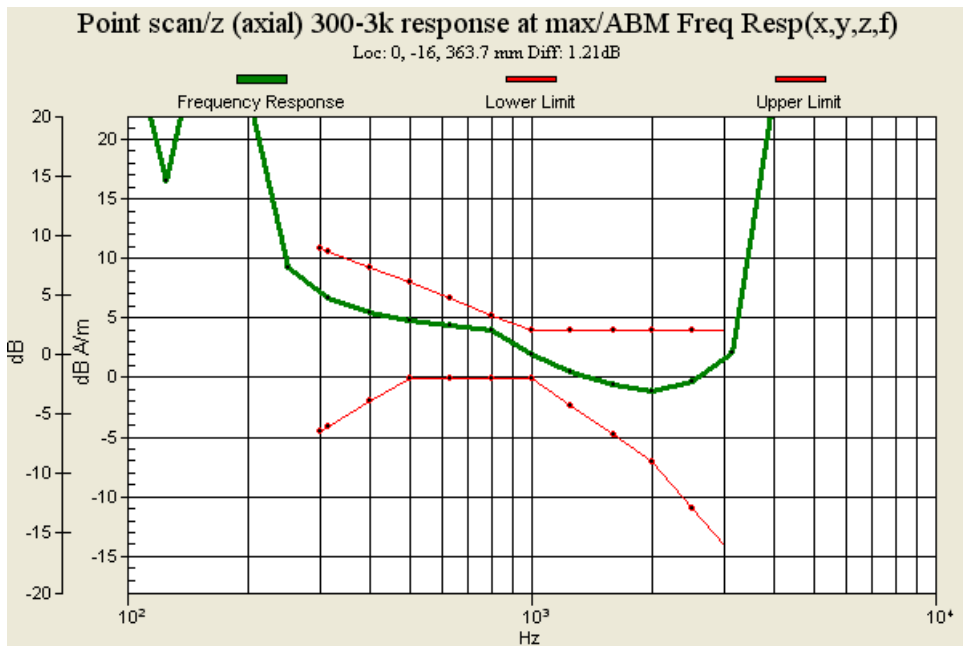**Figure 9.2: Frequency Response of GSM850 for Ch189**

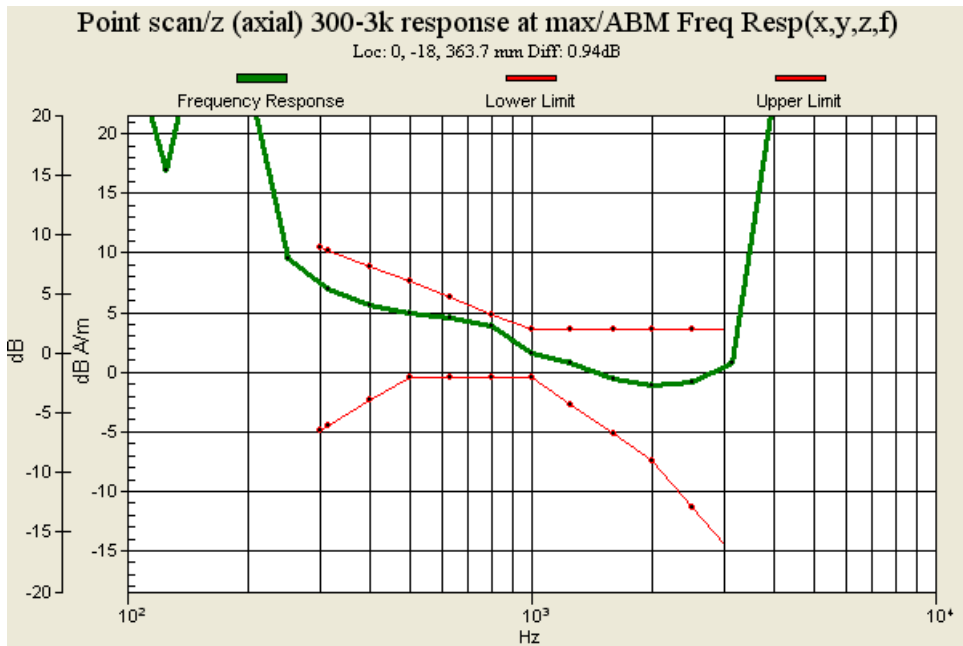**Figure 9.3: Frequency Response of GSM850 for Ch251**

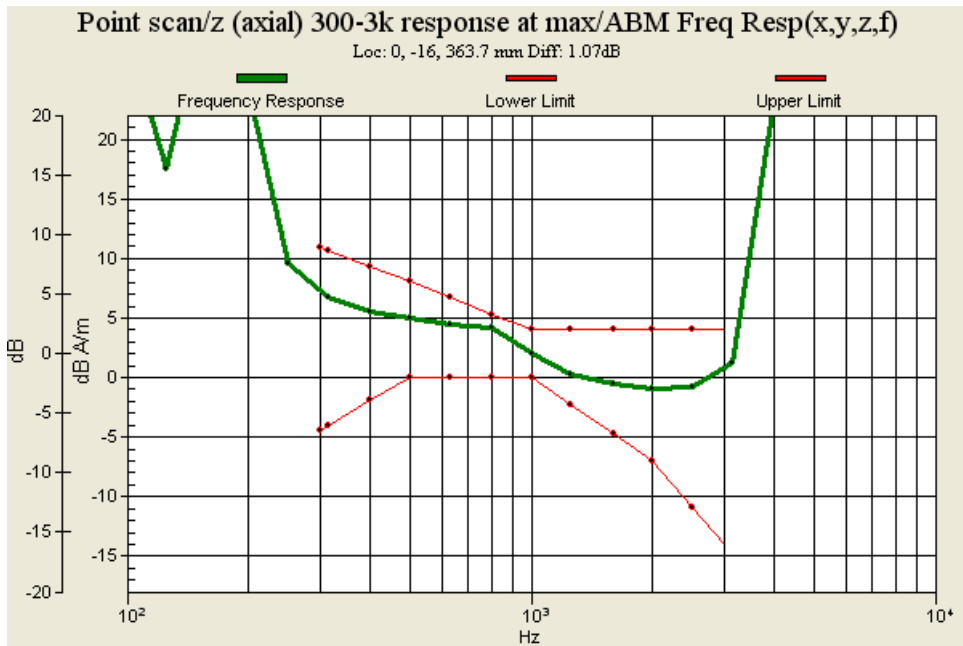**Figure 9.4: Frequency Response of PCS1900 for Ch512**

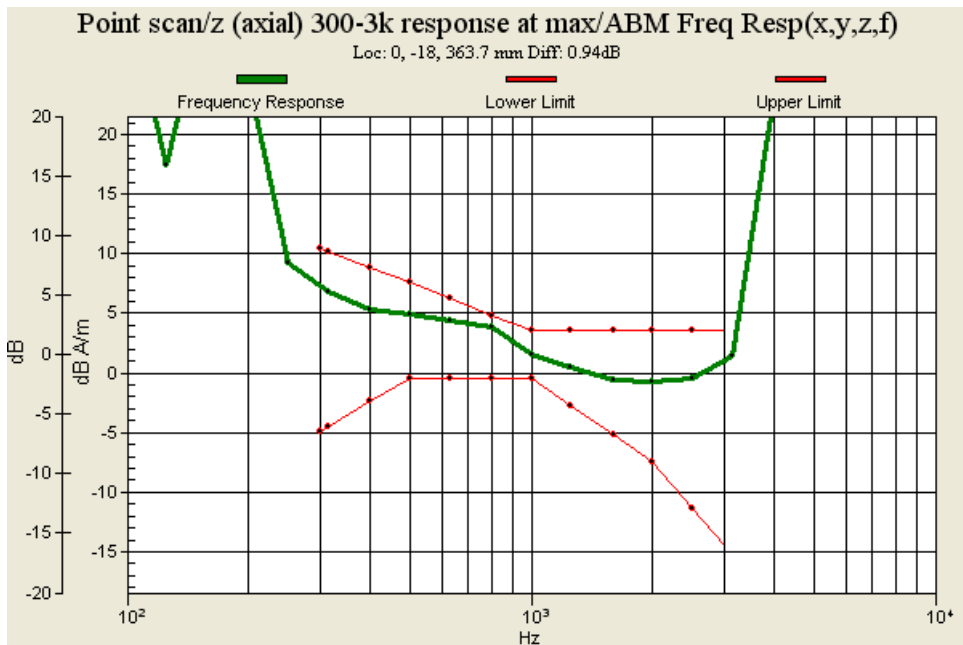**Figure 9.5: Frequency Response of PCS1900 for Ch661**

Figure 9.6: Frequency Response of PCS1900 for Ch810

9.2 *T-Coil Coupling Field Intensity*

9.2.1 *Axial Field Intensity*

Cell Phone Mode	Minimum limit (dB A/m)	Result (dB A/m)	Verdict
GSM850	-18	4.510	**Pass**
PCS1900	-18	4.600	**Pass**

9.2.2 *Radial Field Intensity*

Cell Phone Mode	Minimum limit (dB A/m)	Result (dB A/m)	Verdict
GSM850	-18	-3.660	**Pass**
PCS1900	-18	-3.640	**Pass**

9.2.3 *Frequency Response at Axial Measurement Point*

Cell Phone Mode	Verdict
GSM850	**Pass**
PCS1900	**Pass**

9.2.4 *Signal Quality*

Cell Phone Mode	Minimum limit (dB)				Minimum Result (dB)	Verdict
	T1	T2	T3	T4		
GSM850	0	10	20	>30	28.10	**T3**
PCS1900	0	10	20	>30	31.30	**T4**

10. *Uncertainty Assessment*

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 10.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-shape
Multiplying factor[a]	$1/k$ [b]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a)   standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b)   is the coverage factor

Table 10.1: Uncertainty classification

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY4 uncertainty Budget is showed in Table 10.2.

Error Description	Uncertainty Value (± %)	Probability Distribution	Divisor	(Ci) ABM1	(Ci) ABM2	Std. Unc. ABM1	Std. Unc. ABM2
Probe Sensitivity							
Reference Level	± 3.0%	Normal	1	1	1	± 3.0%	± 3.0%
AMCC Geometry	± 0.4%	Rectangular	√3	1	1	± 0.2%	± 0.2%
AMCC Current	± 0.6%	Rectangular	√3	1	0.145	± 0.4%	± 0.4%
Probe Positioning during Calibration	± 0.1%	Rectangular	√3	1	1	± 0.1%	± 0.1%
Noise Contribution	± 0.7%	Rectangular	√3	0.0143	1	± 0.0%	± 0.4%
Frequency Slope	± 5.9%	Rectangular	√3	1	1	± 0.3%	± 3.5%
Probe System							
Repeatability/Drift	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%
Linearity/Dynamic Range	± 0.6%	Rectangular	√3	1	1	± 0.4%	± 0.4%
Acoustic Noise	± 1.0%	Rectangular	√3	0.1	1	± 0.1%	± 0.6%
Probe Angle	± 2.3%	Rectangular	√3	1	1	± 1.4%	± 1.4%
Spectral Processing	± 0.9%	Rectangular	√3	1	1	± 0.5%	± 0.5%
Integration Time	± 0.6%	Normal	1	1	5	± 0.6%	± 3.0%
Field Distribution	± 0.2%	Rectangular	√3	1	1	± 0.1%	± 0.1%
Test Signal							
Ref. Signal Spectral Response	± 0.6%	Rectangular	√3	0	1	± 0.0%	± 0.4%
Positioning							
Probe Positioning	± 1.9%	Rectangular	√3	1	1	± 1.1%	± 1.1%
Phantom Thickness	± 0.9%	Rectangular	√3	1	1	± 0.5%	± 0.5%
DUT Positioning	± 1.9%	Rectangular	√3	1	1	± 1.1%	± 1.1%
External Contributions							
RF Interference	± 0.0%	Rectangular	√3	1	0.3	± 0.0%	± 0.0%
Test Signal Variation	± 2.0%	Rectangular	√3	1	1	± 1.2%	± 1.2%
Combined Uncertainty							
Combined Std. Uncertainty (ABM Field)						± 4.1%	± 6.1%
Expanded Std. Uncertainty						**± 8.1%**	**± 12.3%**

Table 10.2: Uncertainty of audio band magnetic measurements

11. References

[1] ANSI C63.19 2007, "American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids"
[2] DASY4 System Hand book.

Appendix A – HAC Measurement Data

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch128_X longitudinal

DUT: 8O3027-02

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.6 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/x (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -5.20 dB A/m
BWC Factor = 0.15103 dB
Location: -5, -15, 363.7 mm

Fine scan/x (longitudinal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -2.97 dB A/m
BWC Factor = 0.15103 dB
Location: -8, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.07 dB A/m
BWC Factor = 0.15103 dB
Location: -8, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 28.4 dB
ABM1 comp = -3.07 dB A/m
BWC Factor = 0.15103 dB
Location: -8, -18, 363.7 mm
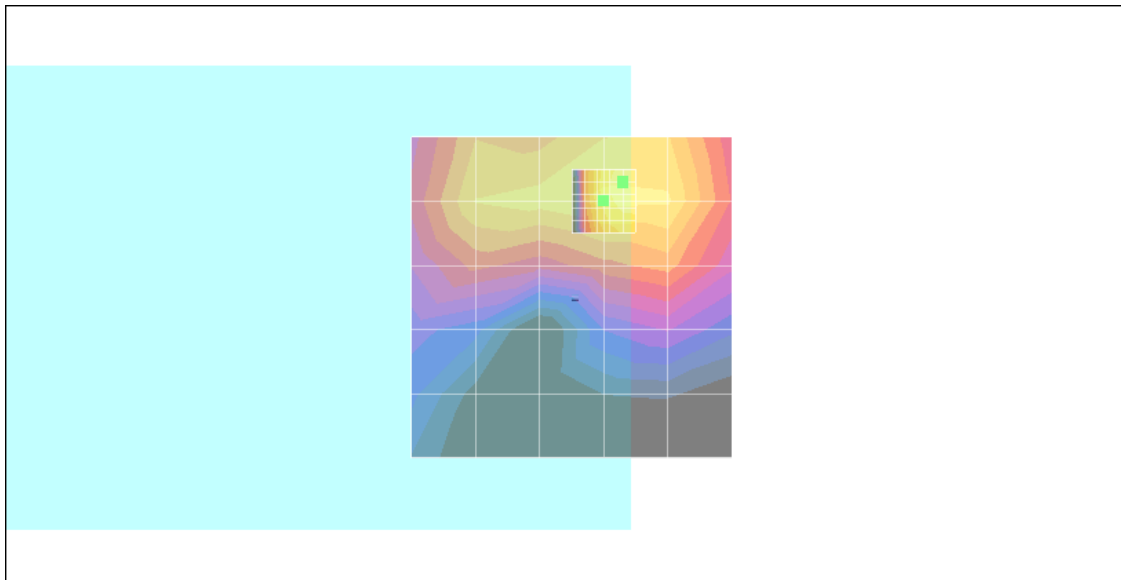
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch128_Y transversal

DUT: 8O3027-02

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.8 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/y (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -4.19 dB A/m
BWC Factor = 0.15103 dB
Location: 5, -25, 363.7 mm

Fine scan/y (transversal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.27 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.44 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 31.9 dB
ABM1 comp = -3.44 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm
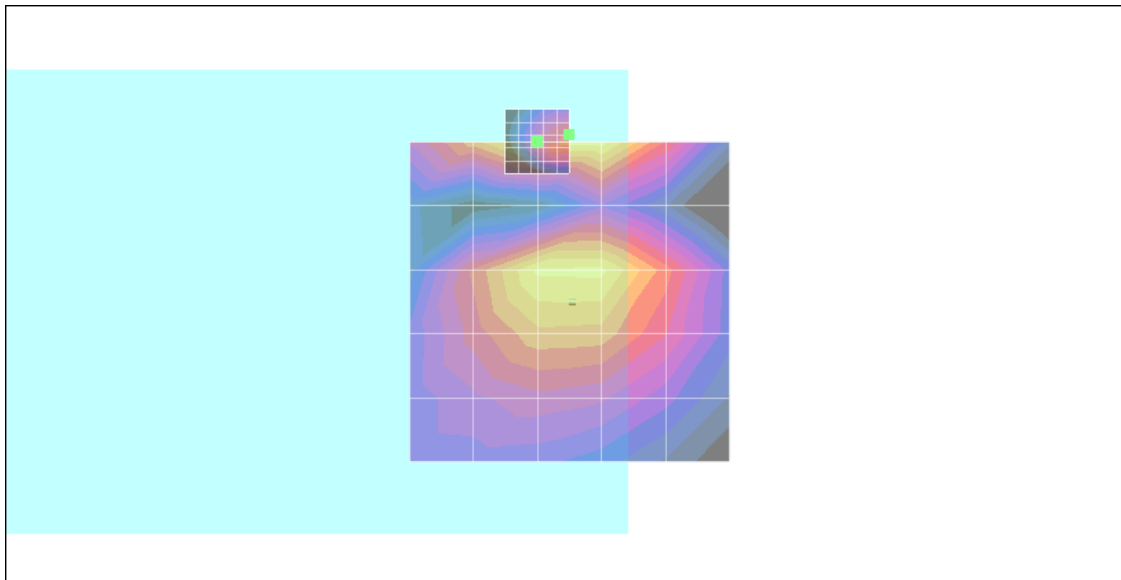
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch128_Z Axial

DUT: 8O3027-02

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, $ε_r$ = 1; ρ = 1 kg/m^3

Ambient Temperature：22.9 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/z (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 2.76 dB A/m
BWC Factor = 0.15103 dB
Location: 5, -15, 363.7 mm

Fine scan/z (axial) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.94 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.88 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 35.1 dB
ABM1 comp = 4.88 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) 300-3k response at max/ABM Freq Resp(x,y,z,f) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav
Output Gain: 72.777
Measure Window Start: 2000ms
Measure Window Length: 4000ms
BWC applied: 10.8 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
Diff = 1.09 dB
BWC Factor = 10.8 dB
Location: 0, -16, 363.7 mm
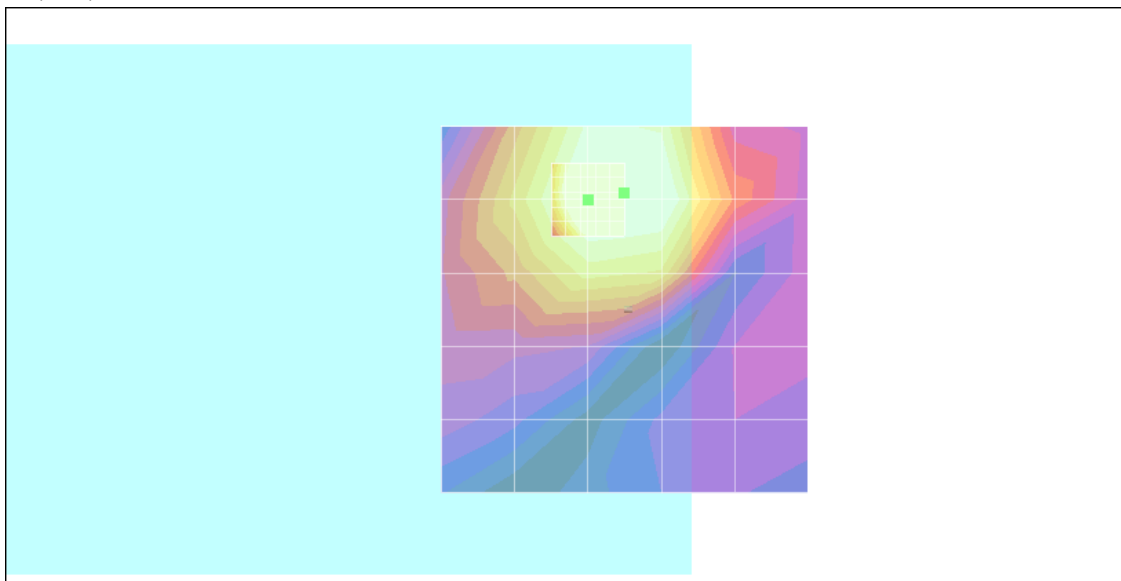
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch189_X longitudinal

DUT: 8O3027-02

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3

Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.7 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/x (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -5.42 dB A/m
BWC Factor = 0.151969 dB
Location: -15, -15, 363.7 mm

Fine scan/x (longitudinal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.23 dB A/m
BWC Factor = 0.15103 dB
Location: -10, -16, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.34 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -16, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 28.1 dB
ABM1 comp = -3.34 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -16, 363.7 mm
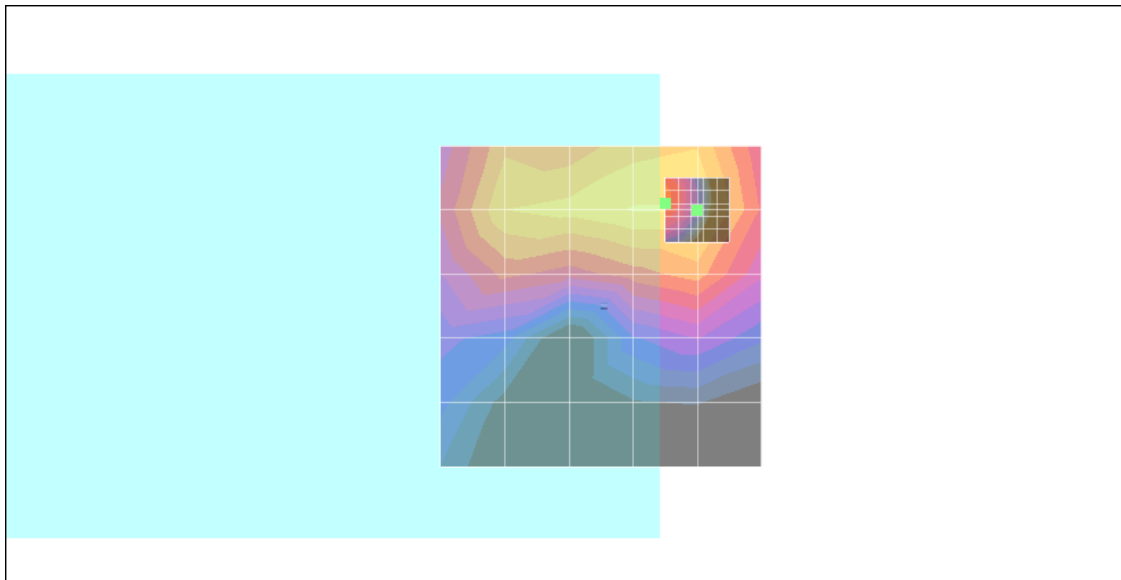
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch189_Y transversal

DUT: 8O3027-02

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.9 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/y (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -4.42 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -25, 363.7 mm

Fine scan/y (transversal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.54 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.63 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 30.9 dB
ABM1 comp = -3.63 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm
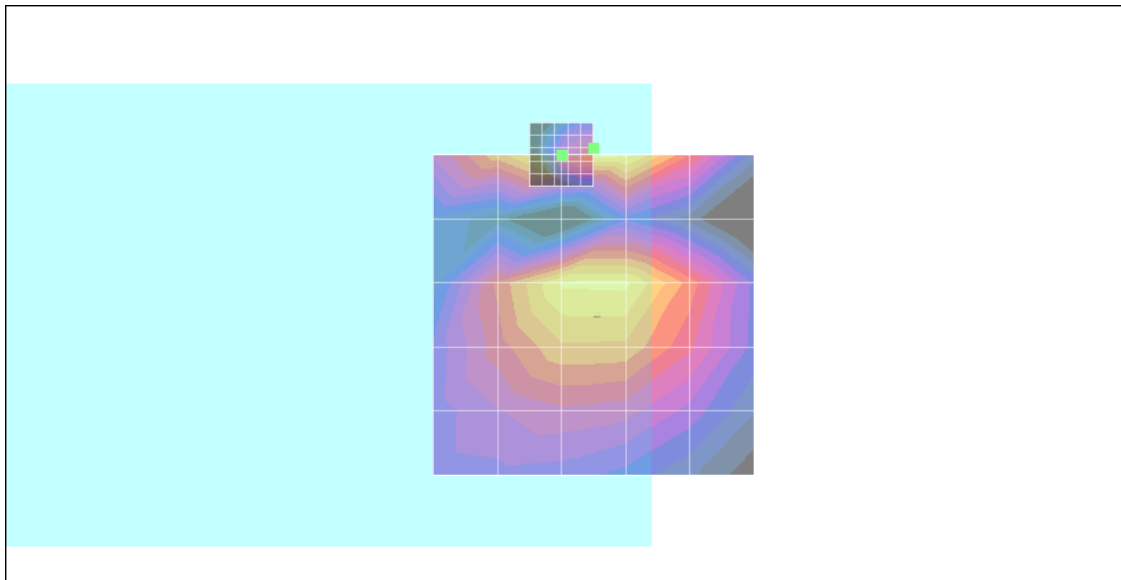
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch189_Z Axial

DUT: 8O3027-02

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature : 22.6 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/z (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 2.52 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -15, 363.7 mm

Fine scan/z (axial) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.70 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.60 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 34.1 dB
ABM1 comp = 4.60 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) 300-3k response at max/ABM Freq Resp(x,y,z,f) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav
Output Gain: 72.777
Measure Window Start: 2000ms
Measure Window Length: 4000ms
BWC applied: 10.8 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
Diff = 0.686 dB
BWC Factor = 10.8 dB
Location: 0, -16, 363.7 mm
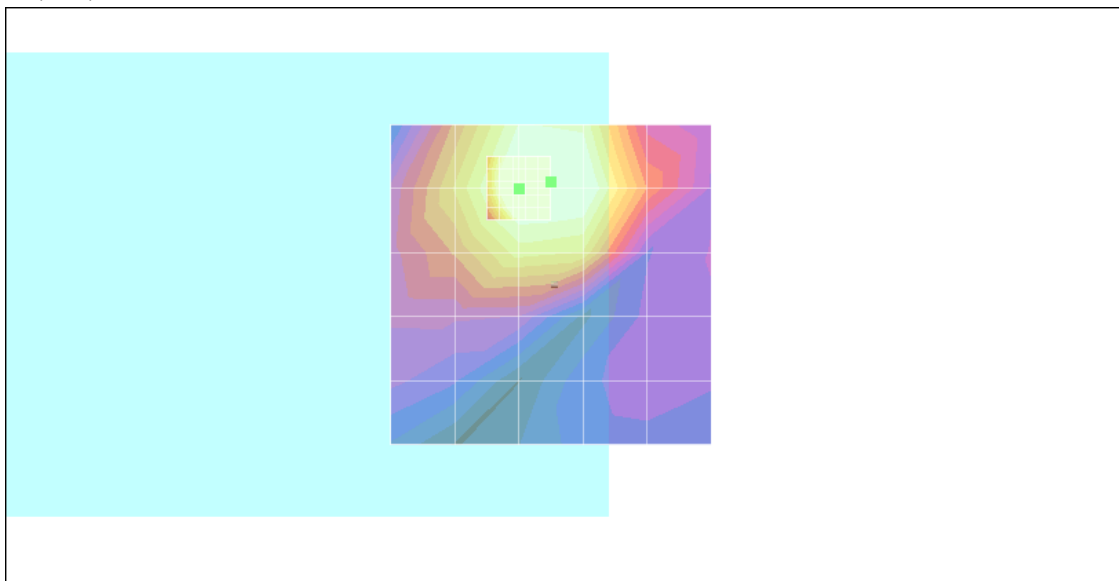
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab　　　　Date: 2009/1/12

T-Coil_GSM850 Ch251_X longitudinal

DUT: 8O3027-02

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.7 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/x (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -5.56 dB A/m
BWC Factor = 0.151969 dB
Location: -5, -15, 363.7 mm

Fine scan/x (longitudinal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.22 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.30 dB A/m
BWC Factor = 0.15103 dB
Location: -10, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 28.6 dB
ABM1 comp = -3.30 dB A/m
BWC Factor = 0.15103 dB
Location: -10, -18, 363.7 mm
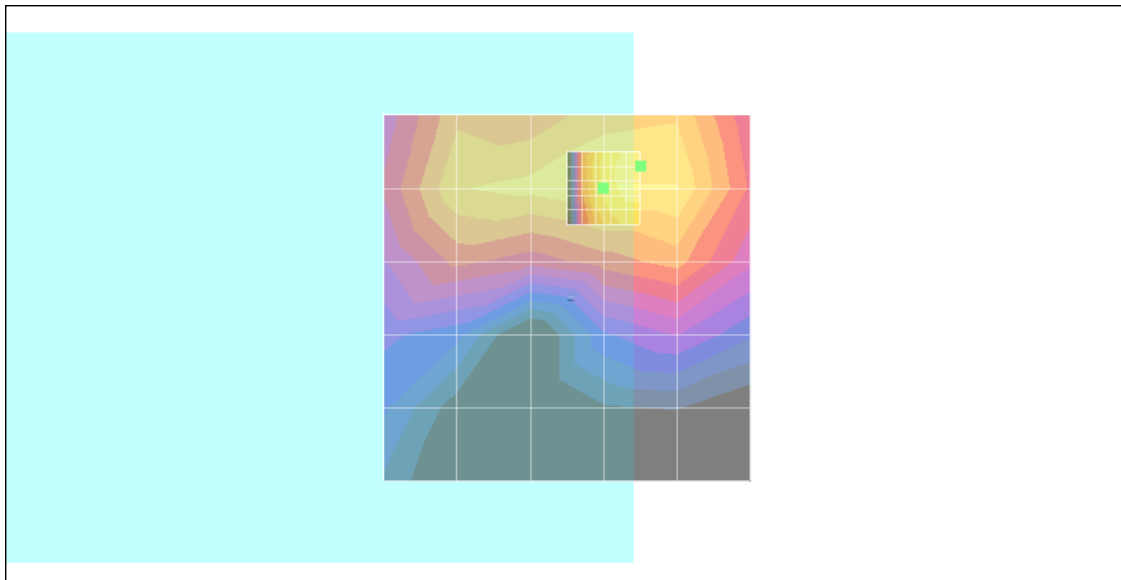
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch251_Y transversal

DUT: 8O3027-02

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.7 ℃

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/y (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -4.49 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -25, 363.7 mm

Fine scan/y (transversal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.62 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.66 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 31.1 dB
ABM1 comp = -3.66 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm
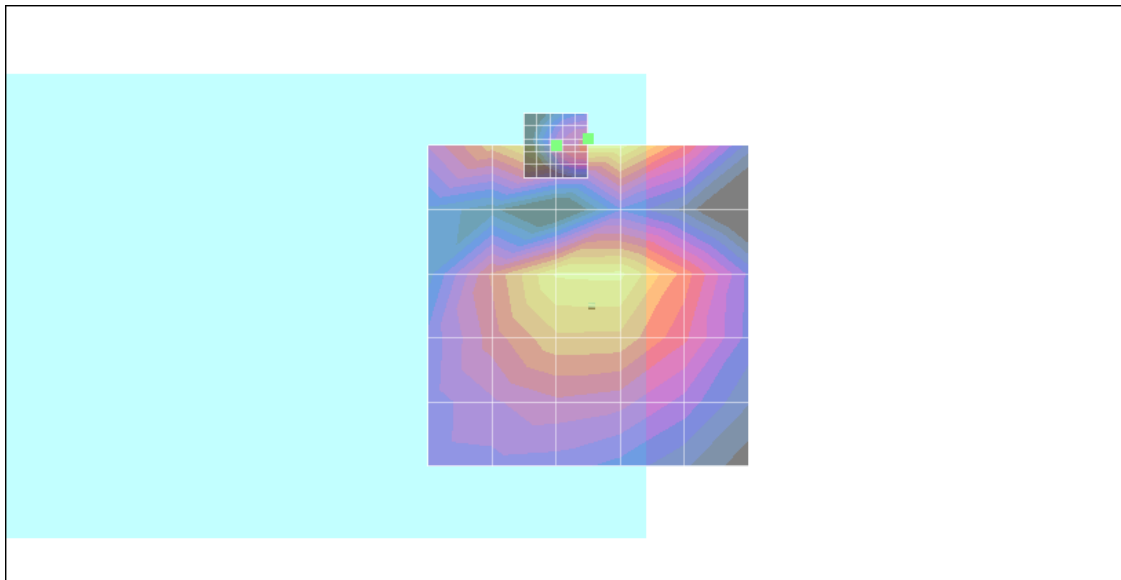
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM850 Ch251_Z Axial

DUT: 8O3027-02

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature ： 22.8

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/z (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 2.46 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -15, 363.7 mm

Fine scan/z (axial) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.69 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.51 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 34.1 dB
ABM1 comp = 4.51 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) 300-3k response at max/ABM Freq Resp(x,y,z,f) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav
Output Gain: 72.777
Measure Window Start: 2000ms
Measure Window Length: 4000ms
BWC applied: 10.8 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
Diff = 1.21 dB
BWC Factor = 10.8 dB
Location: 0, -16, 363.7 mm
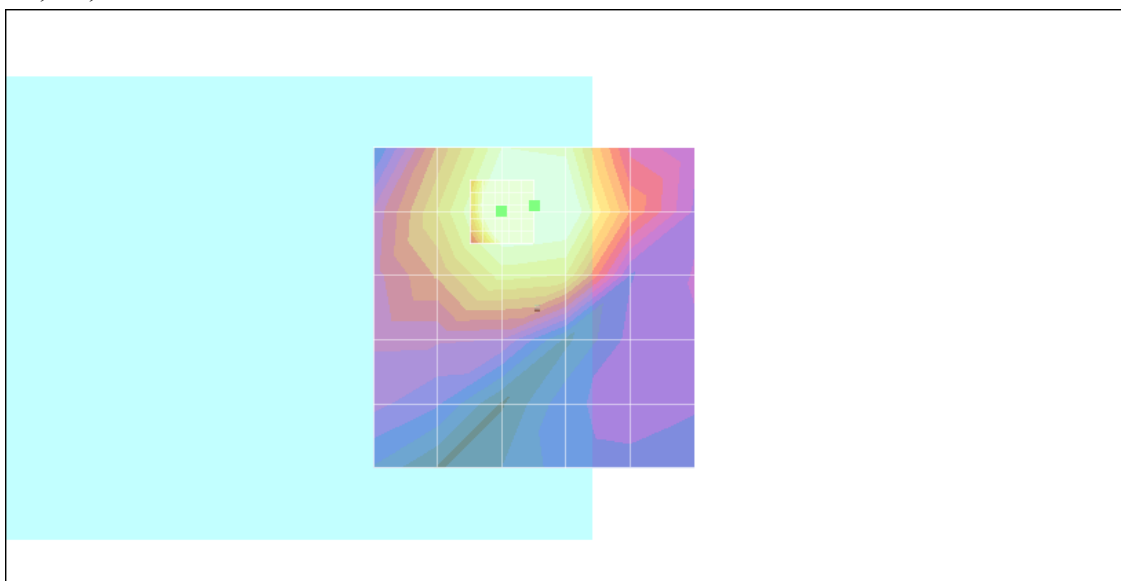
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch512_X longitudinal

DUT: 8O3027-02

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.9

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/x (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -5.34 dB A/m
BWC Factor = 0.151969 dB
Location: -15, -15, 363.7 mm

Fine scan/x (longitudinal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.13 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.10 dB A/m
BWC Factor = 0.15103 dB
Location: -10, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 31.3 dB
ABM1 comp = -3.10 dB A/m
BWC Factor = 0.15103 dB
Location: -10, -18, 363.7 mm
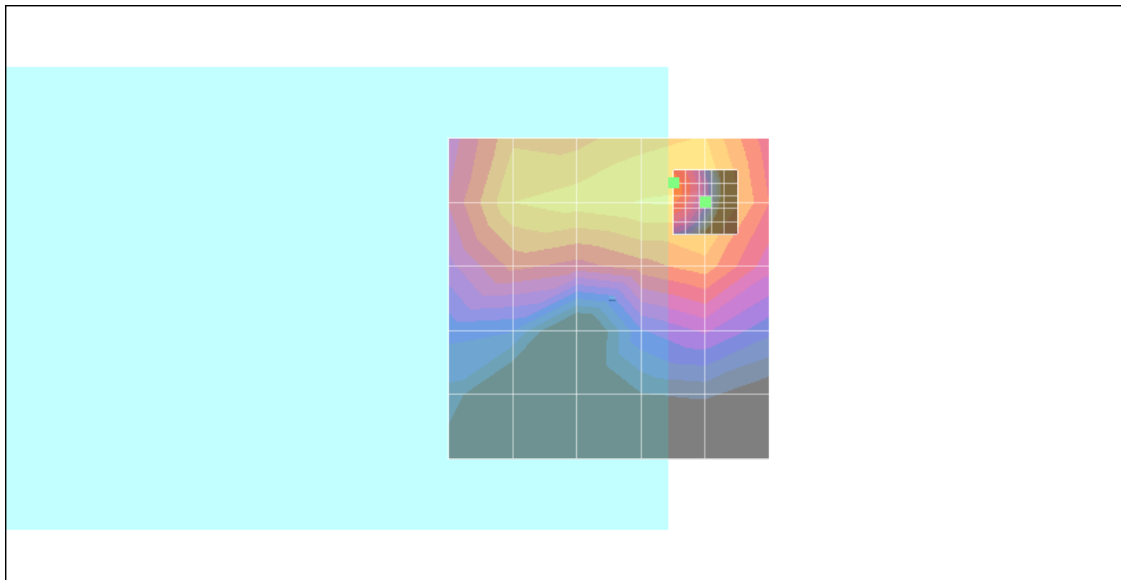
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch512_Y transversal

DUT: 8O3027-02

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.6

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/y (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -4.48 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -25, 363.7 mm

Fine scan/y (transversal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.40 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.59 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 32.3 dB
ABM1 comp = -3.59 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm
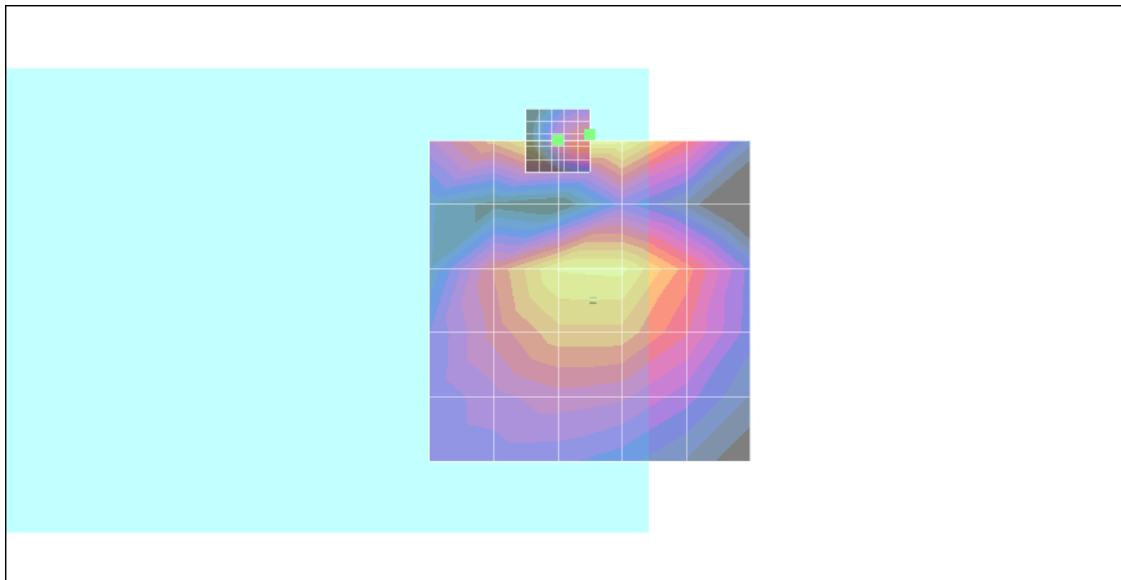
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch512_Z Axial

DUT: 8O3027-02

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.7

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/z (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 2.48 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -15, 363.7 mm

Fine scan/z (axial) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.82 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -18, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.70 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -18, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 35.0 dB
ABM1 comp = 4.70 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -18, 363.7 mm

Point scan/z (axial) 300-3k response at max/ABM Freq Resp(x,y,z,f) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav
Output Gain: 72.777
Measure Window Start: 2000ms
Measure Window Length: 4000ms
BWC applied: 10.8 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
Diff = 0.938 dB
BWC Factor = 10.8 dB
Location: 0, -18, 363.7 mm
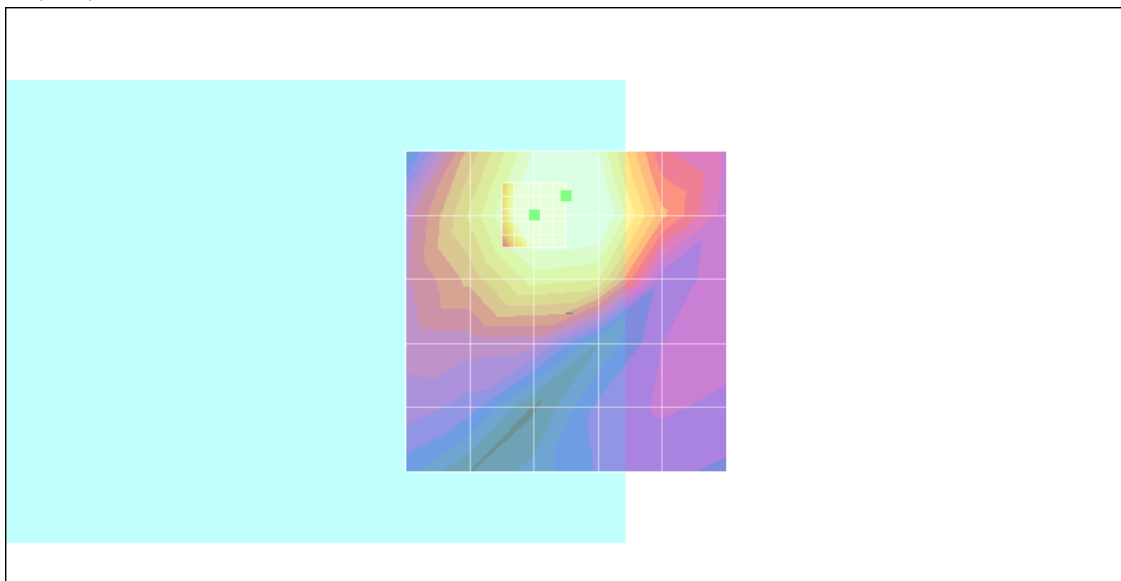
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch661_X longitudinal

DUT: 8O3027-02

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.7

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/x (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -5.38 dB A/m
BWC Factor = 0.151969 dB
Location: -15, -15, 363.7 mm

Fine scan/x (longitudinal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.19 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.21 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 31.4 dB
ABM1 comp = -3.21 dB A/m
BWC Factor = 0.151969 dB
Location: -10, -18, 363.7 mm
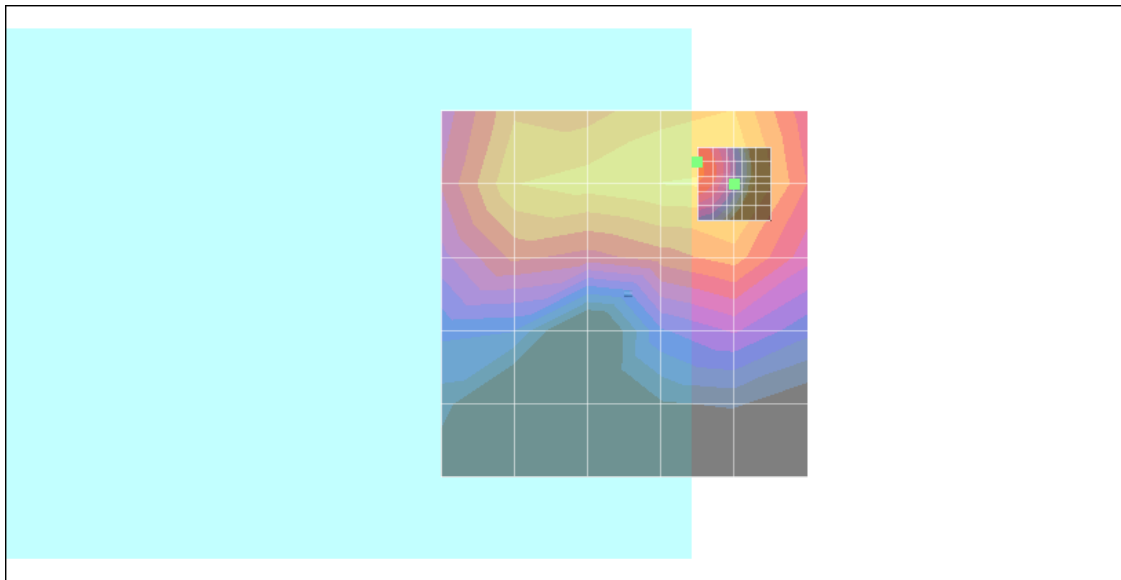
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch661_Y transversal

DUT: 8O3027-02

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.7

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/y (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -4.51 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -25, 363.7 mm

Fine scan/y (transversal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.47 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.53 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 32.2 dB
ABM1 comp = -3.53 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm
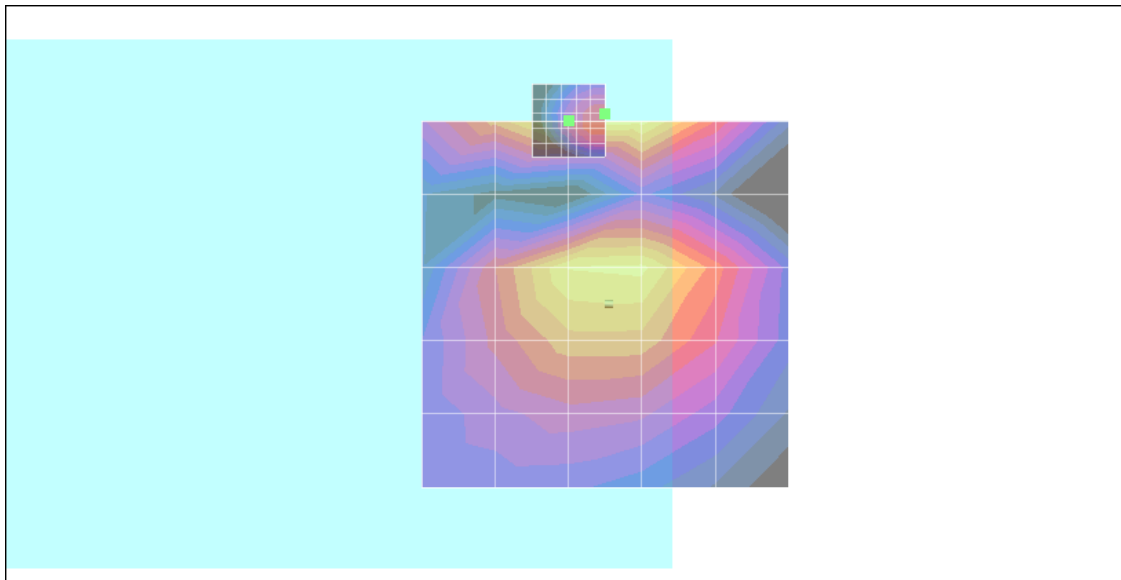
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab　　　　Date: 2009/1/12

T-Coil_GSM1900 Ch661_Z Axial

DUT: 8O3027-02

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.7

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/z (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 2.41 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -15, 363.7 mm

Fine scan/z (axial) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.75 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.77 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm


Cursor:
ABM1/ABM2 = 34.9 dB
ABM1 comp = 4.77 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -16, 363.7 mm

Point scan/z (axial) 300-3k response at max/ABM Freq Resp(x,y,z,f) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav
Output Gain: 72.777
Measure Window Start: 2000ms
Measure Window Length: 4000ms
BWC applied: 10.8 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
Diff = 1.07 dB
BWC Factor = 10.8 dB
Location: 0, -16, 363.7 mm
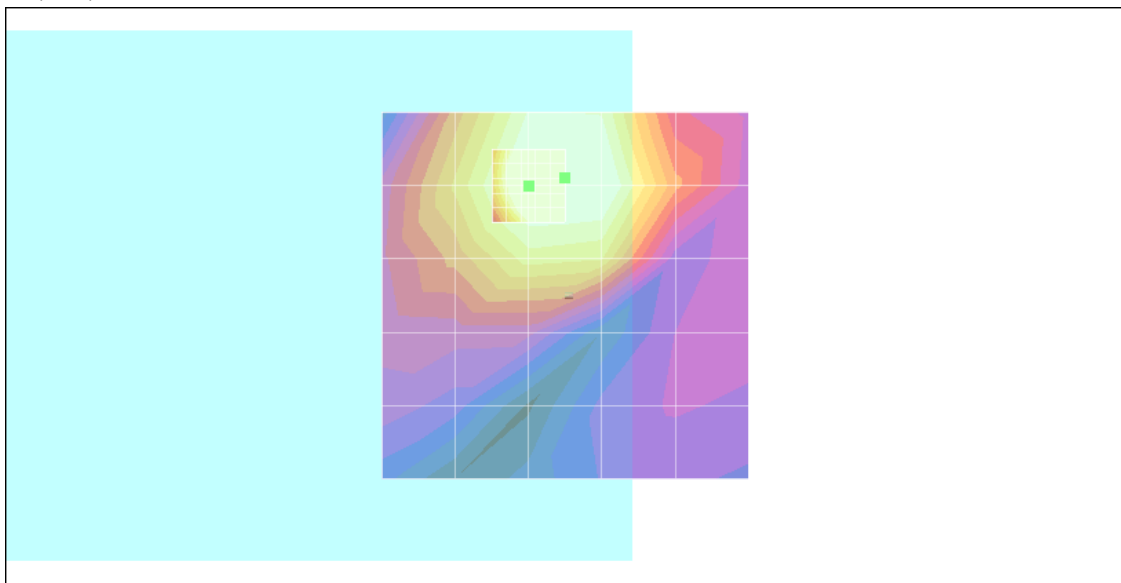
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch810_X longitudinal

DUT: 8O3027-02

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.6

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/x (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -5.36 dB A/m
BWC Factor = 0.151969 dB
Location: -5, -15, 363.7 mm

Fine scan/x (longitudinal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.19 dB A/m
BWC Factor = 0.151969 dB
Location: -8, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.27 dB A/m
BWC Factor = 0.15103 dB
Location: -8, -18, 363.7 mm

Point scan/x (longitudinal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 31.3 dB
ABM1 comp = -3.27 dB A/m
BWC Factor = 0.15103 dB
Location: -8, -18, 363.7 mm
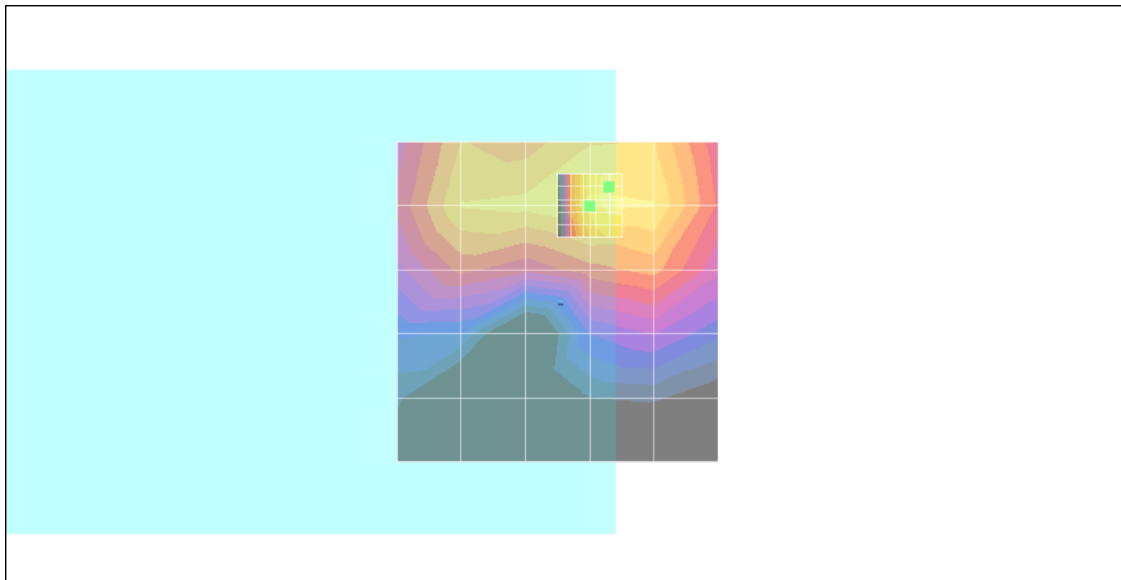
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch810_Y transversal

DUT: 8O3027-02

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3

Ambient Temperature：22.6

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/y (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -4.38 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -25, 363.7 mm

Fine scan/y (transversal) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.53 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = -3.64 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm

Point scan/y (transversal) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 32.3 dB
ABM1 comp = -3.64 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -26, 363.7 mm
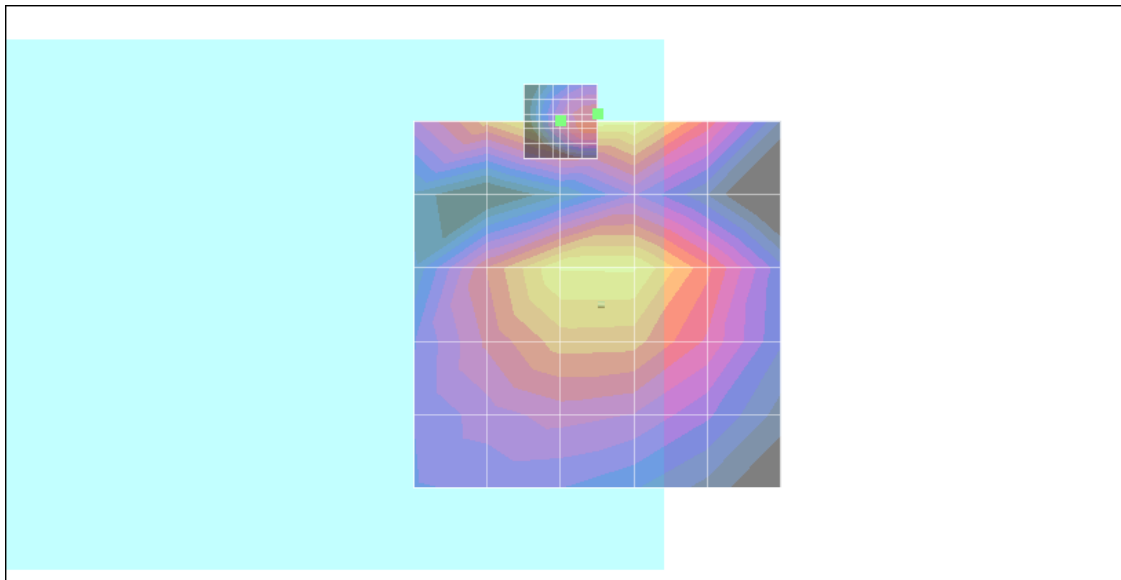
0 dB = 1.00A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2009/1/12

T-Coil_GSM1900 Ch810_Z Axial

DUT: 8O3027-02

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3

Ambient Temperature：22.6

DASY4 Configuration:
- Probe: AM1DV2 - 1030; ; Calibrated: 2008/4/16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Coarse Scans/z (axial) scan 50 x 50 (grid 10) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 2.63 dB A/m
BWC Factor = 0.151969 dB
Location: 5, -15, 363.7 mm

Fine scan/z (axial) scan 10 x 10 (grid 2) with noise/ABM Signal(x,y,z) (6x6x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.151969 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.68 dB A/m
BWC Factor = 0.151969 dB
Location: 0, -18, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM Signal(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1 comp = 4.60 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -18, 363.7 mm

Point scan/z (axial) scan at point with noise/ABM SNR(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.161
Measure Window Start: 0ms
Measure Window Length: 2000ms
BWC applied: 0.15103 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
ABM1/ABM2 = 35.0 dB
ABM1 comp = 4.60 dB A/m
BWC Factor = 0.15103 dB
Location: 0, -18, 363.7 mm

Point scan/z (axial) 300-3k response at max/ABM Freq Resp(x,y,z,f) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav
Output Gain: 72.777
Measure Window Start: 2000ms
Measure Window Length: 4000ms
BWC applied: 10.8 dB
Device Reference Point: 0.000, 0.000, 353.7 mm

Cursor:
Diff = 0.944 dB
BWC Factor = 10.8 dB
Location: 0, -18, 363.7 mm
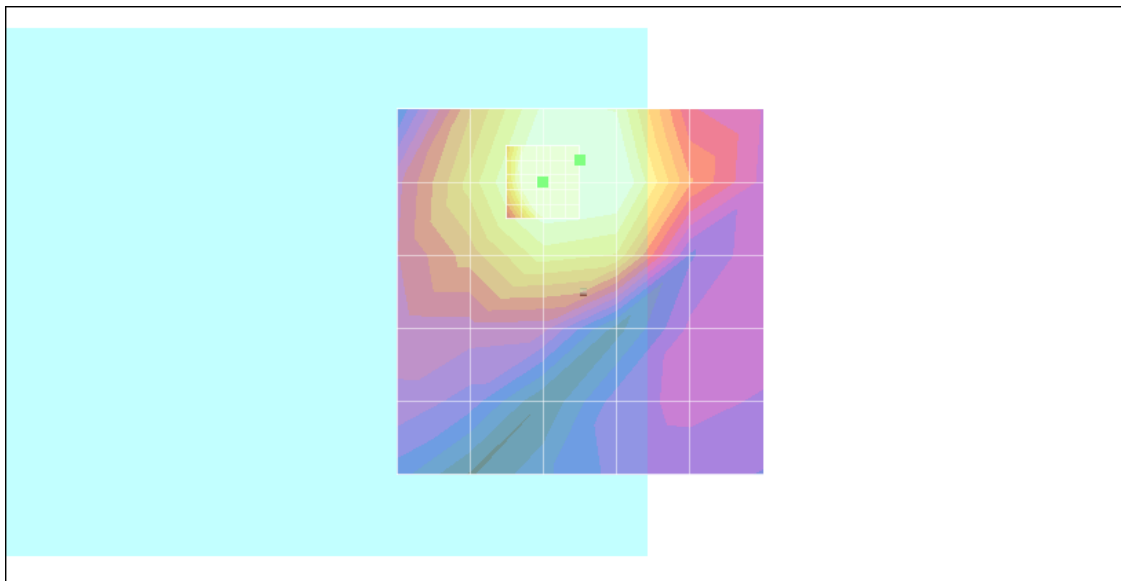
0 dB = 1.00A/m

Appendix B – Calibration Data

Please refer to the calibration certificates of DASY as below.